Total No. of Printed Pages:2

SUBJECT CODE NO:- P-236

FACULTY OF ENGINEERING AND TECHNOLOGY
T.E.(CSE/IT) Examination May/June 2017
Design & Analysis of Algorithms
(Revised)

[Time: Three Hours] **[Max.Marks:80]**

Please check whether you have got the right question paper.

N.B i) Q.No.1 from section A and Q.No.6 from section B are compulsory.
ii) Solve any two questions from the remaining questions of each section.

Section A

Q.1 Attempt any five questions 2*5=10

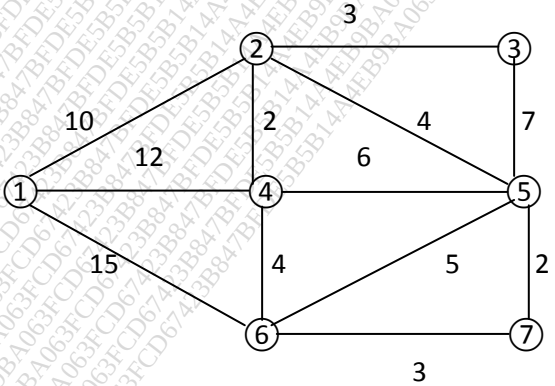
a) What are algorithm design techniques?
b) What are performance measurement parameters of an algorithm?
c) Write iterative algorithm to find factorial of a numbers
d) Define feasible and optimal solution
e) Define minimum cost spanning tree
f) Write any two characteristics of greedy algorithm
g) Define asymptotic notation
h) Explain job sequencing with deadline problem

Q.2 a) Write an algorithm to find maximum and minimum number in a list using divide and conquer 08
b) Explain linear search method and compute its best, worst and average space time complexity 07

Q.3 a) Explain time complexity of binary search method in best, worst and average case for successful and unsuccessful search 07
b) Explain quick sort using the given data and comment on its time complexity 08
{ 50,50, 60, 60, 40, 40, 30, 30, 20, 20 }

Q.4 a) What is optimal merge pattern? Find optimal merge pattern for 10 files whose length are (28, 32, 12, 05, 84, 53, 91, 35, 3, 11) Draw binary merge tree. 10
b) Explain single source shortest path problem 05

Q.5 a) Compute minimum cost spanning tree for the following graph 09



b) Explain knapsack problem and define objective function, constraints, feasible and optimal solution. 06

Section B

Q.6 Attempt any five question 2*5=10

a) Differentiate greedy method with dynamic programming
b) Define all pairs shortest path problem
c) What are explicit & implicit constraints
d) What is least cost search
e) State 8-queens problem
f) Write branch and bound algorithmic method
g) State any two difference between dynamic & back tracking
h) Explain dead-node and live-node

Q.7 a) Construct an optimal binary search tree for the identifies set (do, if, int, while) with given probabilities 10

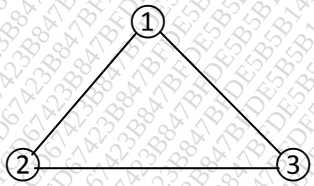
P (1:4) = { 3,3,1,1 }
q (0:4) = { 2,3,1,1,1 }

b) Write tree traversal algorithm 05

Q.8 a) What is criterion function and solution space of back tracking? Explain and solve four queens problem using back tracking 10

b) Explain sum of subsets problem and define its implicit constraints 05

Q.9 a) Explain graph coloring problem and solve it for the following graph considering three colors 07



b) Explain multistage graph problem and write steps to solve it using dynamic programming 08

Q.10 a) Solve the following TSP using branch and bound for the given cost matrix 10

$$\begin{bmatrix} \infty & 10 & 15 & 20 \\ 5 & \infty & 9 & 10 \\ 6 & 13 & \infty & 12 \\ 8 & 8 & 9 & \infty \end{bmatrix}$$

b) Define 15-puzzle problem 05